

## Practice With Calculator Active Questions

1. Let  $f$  be the function given by  $f(x) = 3e^{2x}$  and let  $g$  be the function given by  $g(x) = 6x^3$ . At what value of  $x$  do the graphs of  $f$  and  $g$  have parallel tangent lines?
- (A)  $-0.701$  (B)  $-0.567$  (C)  $-0.391$  (D)  $-0.302$  (E)  $-0.258$
2. Which of the following is an equation of the line tangent to the graph of  $f(x) = x^4 + 2x^2$  at the point where  $f'(x) = 1$ ?
- (A)  $y = 8x - 5$  (B)  $y = x + 7$  (C)  $y = x + 0.763$   
(D)  $y = x - 0.122$  (E)  $y = x - 2.146$
3. If  $f(x) = \sqrt[5]{x^3} - 2x$ , then  $f'(\sqrt{3}) =$
- A) 0.129 B) 0.902 C) 0.906 D) 1.116 E) 2.173
4. Given:  $f(x) = 2\sin x$  on the closed interval  $\left[\frac{\pi}{6}, \frac{2\pi}{3}\right]$ . For what value of  $c$  does  $f'(c) = \frac{f(b) - f(a)}{b - a}$ ?
- A) 1.086 B) 1.336 C) 1.806 D) 2.056 E) None of these
5. For which of the following functions is it true that  $f'(x) \geq f(x)$  for  $0 < x < 1$ ?
- A)  $f(x) = \sqrt{x}$  B)  $f(x) = x^2$  C)  $f(x) = x^3$   
D)  $f(x) = \ln x$  E)  $f(x) = \sin x$
6. The function  $f(x) = \sin(e^{2x})$  has one real root in the interval  $\left[0, \frac{\pi}{4}\right]$ . The value of the derivative at this point is
- A)  $-6.283$  B)  $-2.000$  C)  $-1.000$  D) 0.109 E) 0.572